

Section 5-6: Quadrilaterals and Parallelograms

By the end of this lesson, you should be able to answer:

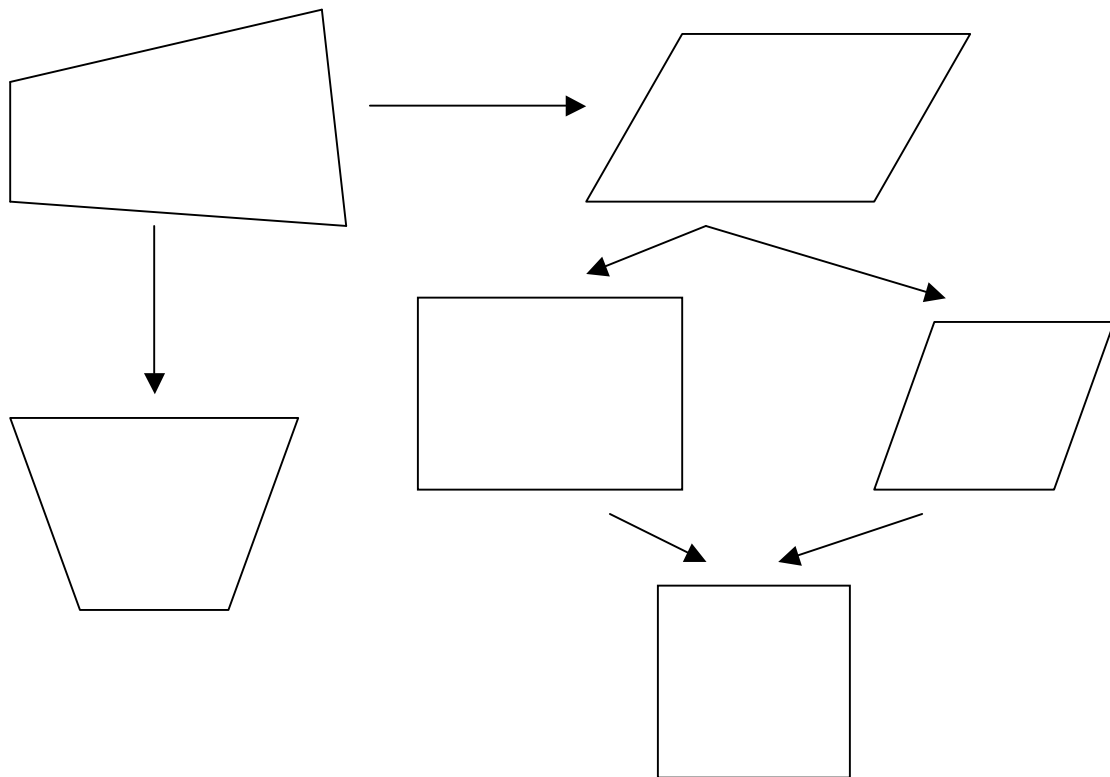
- How do you classify different types of quadrilaterals?
- What are the properties of parallelograms, and how do you use them?

Where you might see this in the real world:

- Construction, civil engineering, navigation

Define the following terms:

1. Quadrilateral
2. Parallelogram
3. Opposite angles
4. Consecutive angles
5. Opposite sides
6. Consecutive sides



Properties of Parallelograms

Property 1: The opposite sides of a parallelogram are congruent

Property 2: The opposite angles of a parallelogram are congruent

Property 3: The consecutive angles of a parallelogram are supplementary

Property 4: The sum of the angle measures of a parallelogram is 360°

Diagonals of Parallelograms

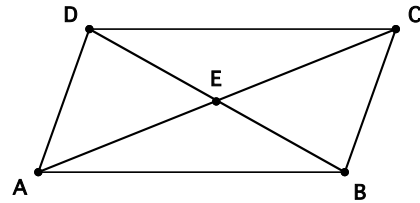
Property 5: The diagonals of a parallelogram bisect each other

Property 6: The diagonals of a rectangle are congruent

Property 7: The diagonals of a rhombus are perpendicular

Example 1: In parallelogram $ABCD$, diagonals \overline{AC} and \overline{BD} intersect at E .

a. If $AE = 5x - 3$ and $EC = 15 - x$, find AC .



b. If $DE = 4y + 1$ and $EB = 5y - 1$, find DB .

Example 2: Select the best answer.

a. In quadrilateral $ABCD$, diagonals \overline{AC} and \overline{BD} intersect at E . What special quadrilateral must $ABCD$ be so that $\triangle AED$ is an isosceles triangle?

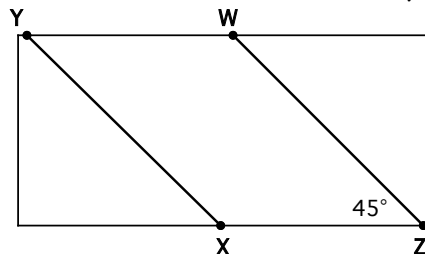
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|------------------|------------|
| A. Parallelogram | B. Rhombus |
| C. Rectangle | D. Square |

b. In rectangle $ABCD$, diagonals \overline{AC} and \overline{BD} intersect at E . Which pair of triangles is not congruent?

- | | |
|--|--|
| A. $\triangle AED$ and $\triangle CEB$ | B. $\triangle AEB$ and $\triangle CEB$ |
| C. $\triangle AED$ and $\triangle AEB$ | D. $\triangle ABD$ and $\triangle BAC$ |

c. A woodworker makes parallel cuts \overline{XY} and \overline{ZW} in a board. The edges of the board, \overline{XZ} and \overline{YW} are also parallel. $YW = 21.5$ in. Find each measure, if possible.

- a. XZ
- b. $m\angle YXZ$
- c. $m\angle XYW$
- d. ZW



Homework: